

WHAT IS CLAIMED IS:

1 1. A computer implemented method of clipping a subject
2 polygon by a clip polygon and forming trapezoids filling the
3 clipped area comprising the steps of:

4 (1) representing the subject polygon and the clip polygon
5 each as a set of edges, each edge represented by minimum Y
6 coordinate, a minimum X coordinate, a maximum Y coordinate and
7 a slope;

8 (2) sorting said subject polygon set of edges and said
9 clip polygon set of edges in increasing values of minimum Y
10 coordinate and storing said sorted set of edges as an array of
11 edges;

12 (3) determining the greatest minimum Y coordinate of a
13 first edge entry in said subject polygon set of edges and a
14 first edge entry in said clip polygon set of edges, thereby
15 determining a bottom Y coordinate of a next trapezoid to be
16 formed;

17 (4) detecting all intersections between edges;

18 (5) forming trapezoids for all areas within both said
19 subject polygon and said clip polygon between successive pairs
20 in the direction perpendicular to the scan line dimension of
21 all edge ends and edge intersections between said greatest
22 minimum Y coordinate of said subject polygon edges and said
23 clip polygon edges and a smallest maximum Y coordinate of said
24 subject polygon and said clip polygon edges.

1 2. A computer implemented method of rasterizing a page
2 in a page description language in a multiprocessor integrated
3 circuit comprising the steps of:

4 interpreting said page in said page description language
5 with a first processor of said multiprocessor integrated
6 circuit;

7 spawning a subtask from said first processor to another
8 of said processors for sorting polygon edges in increasing
9 minimum Y coordinate.

1 3. The computer implemented method of claim 4, wherein:
2 said first processor is a reduced instruction set
3 processor having a floating point computation unit; and
4 each of said other processors is a digital signal
5 processor having an integer multiplier unit.

1 4. The computer implemented method of claim 5, further
2 comprising:

3 spawning a subtask from said first processor to another
4 of said processors for detecting a Y coordinate of edge
5 intersection via successive midpoint approximation.

1 5. The computer implemented method of claim 5, further
2 comprising:

3 calculating a Y coordinate of edge intersection employing
4 said floating point calculation unit of said first processor.

1 6. A printer comprising:

2 a transceiver adapted for bidirectional communication
3 with a communications channel;

4 a memory;

5 a print engine adapted for placing color dots on a
6 printed page according to received image data and control
7 signals; and

8 a programmable data processor connected to said
9 transceiver, said memory and said print engine, said
10 programmable data processor programmed to
11 receive print data corresponding to pages to be
12 printed from the communications channel via said
13 transceiver;
14 convert said print data into image data and control
15 signals for supply to said print engine for printing a
16 corresponding page, said conversion including clipping a
17 subject polygon by a clip polygon and forming trapezoids
18 filling the clipped area by:
19 representing the subject polygon and the clip
20 polygon each as a set of edges, each edge
21 represented by minimum Y coordinate, a minimum X
22 coordinate, a maximum Y coordinate and a slope,
23 sorting said subject polygon set of edges and
24 said clip polygon set of edges in increasing values
25 of minimum Y coordinate and storing said sorted set
26 of edges as an array of edges,
27 determining the greatest minimum Y coordinate
28 of a first edge entry in said subject polygon set
29 of edges and a first edge entry in said clip
30 polygon set of edges, thereby determining a bottom
31 Y coordinate of a next trapezoid to be formed,
32 detecting all intersections between edges,
33 forming trapezoids for all areas within both
34 said subject polygon and said clip polygon between
35 successive pairs in the direction perpendicular to
36 the scan line dimension of all edge ends and edge
37 intersections between said greatest minimum Y
38 coordinate of said subject polygon edges and said
39 clip polygon edges and a smallest maximum Y

40 coordinate of said subject polygon and said clip
41 polygon edges; and
42 controlling said print engine according to said
43 image data and control signals to print a corresponding
44 page.

1 7. A printer comprising:
2 a transceiver adapted for bidirectional communication
3 with a communications channel;
4 a memory;
5 a print engine adapted for placing color dots on a
6 printed page according to received image data and control
7 signals; and
8 a multiprocessor integrated circuit connected to said
9 transceiver, said memory and said print engine, said
10 multiprocessor integrated circuit including a plurality of
11 data processors collectively programmed to
12 receive print data corresponding to pages to be
13 printed from the communications channel via said
14 transceiver;
15 convert said print data into image data and control
16 signals for supply to said print engine for printing a
17 corresponding page, said conversion including rasterizing
18 a page in a page description language by:
19 interpreting said page in said page
20 description language with a first data processor of
21 said multiprocessor integrated circuit,
22 spawning a subtask from said first data
23 processor to another of said plurality of data
24 processors for sorting polygon edges in increasing
25 minimum Y coordinate; and

26 controlling said print engine according to said
27 image data and control signals to print a corresponding
28 page.

1 8. The printer of claim 7, wherein:
2 said first data processor of said multiprocessor
3 integrated circuit is a reduced instruction set processor
4 having a floating point computation unit; and
5 each of said other data processors of said multiprocessor
6 integrated circuit is a digital signal processor having an
7 integer multiplier unit.

1 9. The printer claim 8, wherein:
2 said multiprocessor integrated circuit is further
3 collectively programmed to spawn a subtask from said first
4 data processor to another of said plurality of data processors
5 for detecting a Y coordinate of edge intersection via
6 successive midpoint approximation.

1 10. The printer of claim 8, wherein:
2 said multiprocessor integrated circuit is further
3 collectively programmed to calculate a Y coordinate of edge
4 intersection employing said floating point calculation unit of
5 said first data processor.